



UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

OCTOBER 30, 1984

NATIONAL SECURITY AND
INTERNATIONAL AFFAIRS DIVISION

B-215969

The Honorable Ed Bethune
House of Representatives

Subject: Reporting on Chemical Testing of the Bigeye
Binary Chemical Bomb
(GAO/NSIAD-85-3)

Dear Mr. Bethune:

In your letters of October 4, 17, and 20, 1983, you requested information on whether the Department of Defense (DOD) had intentionally withheld information from the Congress on the Bigeye binary chemical bomb's test failures, primarily throughout calendar year 1982 and the first 4 months of calendar year 1983. Subsequently, we discussed our findings and conclusions at several meetings with you and your staff. Details of our review are included as enclosure I.

On June 6, 1984, you asked us to give you a written report on our findings and to include information on why congressional critics of the system had not been made aware of a January 1984 test failure involving the bomb's impulse cartridge until just before the May 1984 debate in the House on the fiscal year 1985 Defense Authorization Act. Also, you asked that we include our evaluation of DOD's fiscal year 1985 budget request for binary chemical weapons.

In accordance with your October requests, our report discusses testing of the Bigeye since the program was restarted in 1976. After the program resumed through 1981, there were eight chemical tests to update earlier program tests on the chemicals. In December 1981, the Secretary of Defense directed that the program be accelerated so that production could start in fiscal year 1984. As a result there were several tests in 1982.

We focused primarily on the events surrounding an October 1982 test failure which later necessitated a restructuring of the program. The test failure resulted from a chemical reaction which involved a rapid increase in temperature and pressure to such an extreme that an inner section of the bomb was forced out the rear of the weapon.

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STEERING COMMITTEE MONITORED PROGRAM

A steering committee drawn from the military services and the Office of the Secretary of Defense (OSD) was established in 1980 to monitor chemical warfare programs, such as the Bigeye. The Deputy Assistant to the Secretary of Defense for Chemical Matters, in the Office of the Assistant to the Secretary of Defense for Atomic Energy, who served as deputy chairman of the committee, told us that he could find no charter for the committee but the committee's responsibilities were to monitor all aspects of the Bigeye program, such as cost, schedule, and performance.

From records we examined and interviews we conducted, we could find no evidence that Navy officials who knew about the chemical test failure formally advised the steering committee or other OSD officials about the test failure, either at committee meetings or in written reports, until about 2 months after the October 1982 blowout of the bomb's inner section. During this 2-month period, the problem was discussed and solutions considered but there is nothing to indicate that steering committee members were involved. In his November 1982 report to the program manager on the progress made in October, the technical project manager discussed the blowout and potential solutions. These were again discussed in a November 16, 1982, "Bigeye Chemical Reaction Meeting" attended by service and contractor personnel. While minutes of this meeting were distributed on November 18, 1982, to all service headquarters, there is no evidence that the steering committee members received copies. The Navy could have done a better job of keeping the committee informed.

In our opinion, the steering committee was also not as diligent as it should have been in monitoring the problems experienced in chemical testing of the Bigeye in calendar year 1982. During calendar year 1982, the committee met with the Navy's Bigeye program office at least three times--in June, July, and again in October. While we found no minutes to determine who had attended and what had been said during the meetings, briefing charts indicated that technical problems had not been discussed, although such problems had been identified and recognized by the Navy program office in at least two instances before briefings to the committee. The Navy's program manager whom we interviewed confirmed that there was no discussion of Bigeye's technical problems at the committee meetings. Instead, the discussions addressed the purposes for which the meetings were called - production and financial matters.

For example, in a July 23, 1982, briefing to the committee, the discussion focused on Bigeye's production schedule and funding. The program office provided no information on the chemical pressure buildup problem or other technical problems

being experienced in the program, although the program office's briefing to Navy representatives a week earlier had highlighted various development problems, including the chemical pressure problem. Also, in a briefing on October 13, 1982, 6 days following the October 7 test failure, the Navy program office disclosed no test failure or other technical problems to the steering committee. The discussion mainly involved obtaining funds from the Congress for testing and low-rate production.

We interviewed the general officers who represented the three services on the steering committee during the latter part of 1982. The Air Force representative said that he was informed of the incident by his action officer in October 1982 but at that time did not recognize the seriousness of the problem. The Army representative could not give us the exact date when he learned about the October 1982 incident. The Navy representative, who retired early in December 1982, told us that he did not recall being advised of the failure. His successor, who joined the committee in December 1982, learned about the October failure sometime in December 1982, at which time he informed the Deputy Assistant for Chemical Matters. The service representatives told us that they did not believe an inordinate amount of time had elapsed from October 1982, when the incident occurred, until December 1982, when the Deputy Assistant for Chemical Matters was informed of the failure. The program office advised us that it felt obliged to provide only the information requested by the committee. As in the other briefings to the committee, financial and production schedule matters appeared to be the major topic of discussion.

While this indicates that the program office did not officially provide information on the pressure problems to OSD officials, there is nothing to indicate OSD did not provide the information in a timely manner to the Congress when advised of the test problems and the impact on the program. The task of informing the Congress would logically have fallen to the Deputy Assistant for Chemical Matters. He had responsibility for the Bigeye and other chemical warfare programs and had approved DOD's budget requests for these programs. Also, he had been communicating frequently with congressional staff members of the House and Senate Armed Services Committees on chemical matters for about three years. According to the Deputy Assistant, he learned of the October 1982 test failure in December 1982 and briefed congressional staff members on the incident in January 1983, after soliciting more particulars about the incident.

The Deputy Assistant for Chemical Matters told us that he was concerned that he had not been told about the October test failure sooner than December. After being told, he appointed a program review panel in January 1983 of nongovernment personnel to evaluate the Bigeye's status in light of the test failure's possible implications.

In March 1983, the panel informed the Deputy Assistant that maintaining the current acquisition schedule would be a high risk due to the time needed to completely analyze the problem and test the solutions being considered. In April 1983, he informed the Congress that due to development problems, DOD was withdrawing fiscal year 1984 production funds for the manufacture of the Bigeye from its budget request and that production would be delayed 1 year.

While a pressure buildup still exists, program officials do not consider it serious, because of a change in delivery tactics whereby a chemical process will not begin until the pilot has released the bomb. Further development and operational tests are required to prove out this concept.

FAILURE OF IMPULSE CARTRIDGE

Concerning your June 6, 1984, request, we could not determine why critics of the system were not made aware until May 1984 of the test failure involving the impulse cartridge which occurred 4 months earlier. A DOD March 1984 report to the Congress disclosed problems with the central injector which houses the impulse cartridge. However, no specific mention was made of the impulse cartridge failure. The failure concerned cracks that appeared on the impulse cartridge which were discovered only after the bomb had been completely disassembled. According to the Office of the Deputy Assistant for Chemical Matters, the failure was easily corrected and there has been no recurrence of the problem. We confirmed this by examining subsequent test results, which did not show any repetition of the failure.

RECOMMENDATION TO THE SECRETARY OF DEFENSE

The Bigeye program has not been designated as a major program for monitoring and reporting requirements. In view of the congressional interest and the sensitivity of the Bigeye program, we are recommending to the Secretary of Defense that he designate Bigeye a major program. As such, added reporting requirements in such areas as testing and cost would be imposed on the program, which should help provide more program visibility to the Congress.

DEFENSE COMMENTS

In response to a draft of this report, OSD stated that it had not covered up, deceived, or withheld information on Bigeye's problems from the Congress and that it was disappointed because the draft appeared to substantiate its position yet the report did not conclude that there had not been a cover-up. OSD stated that

". . . It is an American characteristic (not only a military one) to try to understand and solve problems and only elevate them, particularly to very high levels, after we have given them our best effort. With hindsight, it is clear that the program management and the Navy should have elevated the problem sooner; however, in the context of the day, it was not clear to those involved."

We believe our report properly reflects the facts as we found them, and it would be inappropriate for us to speculate on the motives of DOD personnel who reported or did not report on the status of the program.

OSD also stated that the letter portion of our draft report disclosed that no records indicated that DOD had ever considered reporting the impulse cartridge failure to the Congress; however, the draft report's enclosure revealed that a March 1984 report was provided to the Congress which discussed problems with the central injector which houses the impulse cartridge. In addition, OSD stated that the problem with the impulse cartridge was minor and easily corrected. We agree with OSD's comments and have revised the report to clarify DOD's actions on the impulse cartridge problem; i.e., that problems with the central injector were discussed in the March 1984 report but no specific mention was made of the impulse cartridge.

Regarding our recommendation that the Secretary of Defense designate the Bigeye a major program, OSD stated that such a designation would impose increased costs in terms of manpower, time, and dollars and other options may be available which would provide the benefits with fewer drawbacks. However, it stated the proposal is under consideration.

Additional OSD comments were made on the draft report and we have made changes, in the interest of accuracy and clarity. The complete OSD comments are included as enclosure II to this report.

COMMENTS BY THE FORMER DEPUTY ASSISTANT TO THE
SECRETARY OF DEFENSE ON CHEMICAL MATTERS

In responding to our draft report, the former Deputy Assistant reiterated the major comments provided by OSD. Regarding the responsibility of the steering committee, the former Deputy Assistant stated that the committee was a coordinating body which addressed a very broad range of issues, such as policy, budget, and arms control, and was not intended to be nor could it effectively serve as a review group for a technical program. He, therefore, took issue with our view that the steering committee was not as diligent as it should have been in monitoring the problems experienced in chemical testing of the Bigeye during 1982.

In the absence of a charter, it is not certain just what tasks were assigned to the committee. We believe, however, the action taken by the Deputy Assistant when he was informed of the October test failure indicated more than a casual interest in the performance aspects of the program. It appears that with a Navy representative on the committee representing the Office of the Chief of Naval Operations, the committee was represented by personnel who would be interested in all phases of the Bigeye program. Also, an evaluation of the program's budget requirements would, in our view, require an assessment of all phases of the program to assess the adequacy of the budget.

The complete comments of the former Deputy Assistant are included as enclosure III.

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A copy of our report assessing DOD's fiscal year 1985 budget request for ammunition, including the Bigeye, has been furnished to you. Excerpts from this report are included as enclosure IV. As explained in the enclosure, continuing technical problems were one of the reasons GAO thought it premature to fund the Bigeye for fiscal year 1985. Information relative to this work was provided to your staff in March 1984, and we briefed you on our review in May 1984.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from its issue date. At that time, we will send copies to the Chairmen of the House and Senate Committees on Armed Services and Appropriations; the Chairmen of the House Committee on Government Operations and Senate Committee on Governmental Affairs; the Secretaries of Defense, the Army, the Navy, and the Air Force; and other interested parties.

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Sincerely yours,

Frank C. Conahan

Frank C. Conahan
Director

Enclosures - 4



REPORTING ON CHEMICAL TESTING
OF THE BIGEYE BINARY CHEMICAL BOMB

DESCRIPTION OF THE BIGEYE WEAPON

The Bigeye binary chemical bomb is a weapon now in development which is to be delivered to the target by aircraft. Its effectiveness will depend on the successful mixing of two nontoxic chemicals identified as QL and sulfur. This mixture creates a lethal, liquid chemical agent which would permeate and contaminate the area over which the bomb is dropped. The liquid chemical QL is to be stored in the bomb, and the sulfur powder is to be stored in a cylindrical tube known as the ballonet, which is kept separate from the bomb.

When a Bigeye mission is assigned, the sulfur-loaded ballonet is inserted in the bomb but remains out of contact with the QL. The bomb is then hung on the aircraft and the pilot begins the flight. Upon approaching the target area, to initiate the chemical mixing process, the pilot releases the bomb and internal devices sense the separation of the bomb which starts the process by releasing the sulfur from the ballonet to mix with the QL, forming a toxic agent. The toxic agent is then disseminated over the target area. Before a test failure in October 1982, in which pressure built up by high temperatures blew the ballonet out of the bomb, the mixing process was to take place while the weapon was still hung on the aircraft. After the test failure, procedures were changed to have the mixing process take place after the weapon was released from the aircraft. This process is known as off-station mixing.

Since the Bigeye is a glide weapon and is to be released at a low altitude, the flight time is extremely short. Therefore, off-station mixing must be very rapid to allow sufficient time during the bomb's flight to the target for the mixture to obtain the concentration needed for it to be effective and to allow for proper dissemination of the agent over the target area before the weapon hits the ground.

The Bigeye weapon is being designed and developed by the Navy for joint use by the Navy and Air Force. The Army is responsible, under the Navy's direction, for testing the chemicals, manufacturing the QL, and storing it in the weapon.

OBJECTIVES, SCOPE, AND METHODOLOGY

We examined the chemical testing completed after the Bigeye program was revamped and resumed in 1976. Our primary objective was to determine whether the Department of Defense (DOD) intentionally withheld notification of chemical test failures from the

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Congress during 1982 and the early part of 1983. We also assessed the results of a test failure in January 1984 and inquired into why the Congress had not been promptly notified. Our review began in October 1983 and was completed in July 1984.

We interviewed officials and examined test data and other documents at the Office of the Assistant to the Secretary of Defense for Atomic Energy; the Director of Air Programs in the Office of the Assistant Secretary of the Navy (Research, Engineering, and Systems); the Strike and Amphibious Warfare Division in the Office of Naval Warfare; the Armament Systems Division of the Naval Air Systems Command Headquarters; the Naval Weapons Center, China Lake, California; the Army Chemical Research and Development Command, Edgewood Arsenal, Aberdeen, Maryland; and the Marquardt Company, Van Nuys, California.

In addition, we provided an opportunity to three key steering committee members who have left the government service to respond to our draft report. The only response received was from the former Deputy Assistant to the Secretary of Defense for Chemical Matters. His response is included as enclosure III.

Our review was made in accordance with generally accepted government auditing standards.

BACKGROUND

In the early program stages, from 1959 until 1969 when the Navy terminated the program, the procedure for delivering the Bigeye was envisioned as being one in which an aircraft would fly at a high altitude and descend to a low altitude when ready to release the bomb. After the program was resumed in 1976 at the direction of the Office of the Secretary of Defense (OSD), the procedure was changed to have the aircraft fly at a low altitude and maintain this altitude until the pilot released the weapon. This change, brought about by more sophisticated air defenses, had a major effect on the program. Early testing of the QL and sulfur was done primarily at low temperatures in anticipation of encountering such temperatures when carrying the weapon at a high altitude. When the procedure was changed to fly at lower altitudes where higher temperatures would be experienced, chemical testing was done mainly at the higher temperatures. This testing at higher temperatures surfaced a pressure buildup phenomenon not previously experienced, which led to a change in the procedure for starting the chemical mixing.

CHEMICAL TESTING

After the restart of the Bigeye program in 1976, toxic chemical testing was conducted solely at the Army's Edgewood Arsenal under the direction of the Navy's technical project

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manager at the Naval Weapons Center at China Lake. The chemical testing was done for the most part in a unit known as a test reactor.

After the program was resumed, relatively low funding, amounting to about \$2 million annually, was provided for the program and only eight chemical tests were done through 1981. Four tests were completed using simulants and the remaining tests used chemicals. According to Army test personnel, the tests were to update the previous tests on the chemicals.

In December 1981, the Secretary of Defense directed that the program be accelerated so that the weapon could be placed in production in fiscal year 1984. As a result, funding was increased and chemical testing was accelerated. The Navy requested an average of about \$9 million in each of the next 3 years, starting with fiscal year 1982.

The Army testers advised us that beginning in February 1982, the chemical tests were initiated primarily at ambient temperatures to accommodate the new procedure for delivering Bigeye at low altitudes. With the testing done at higher temperatures, a rapid pressure buildup was being experienced after initiating the mixing process. In an attempt to stabilize the pressure buildup, an additive was included in the QL. Varying the amounts of the additive, however, still did not stabilize the pressure.

Another problem also limited the Army's attempt to determine the level at which the pressure would stabilize after initiating the mixing process. The capacity of the test reactor, designed to test the chemicals, was limited to a pressure of 250 pounds per square inch. As the pressure approached this level, the reactor was vented to reduce the pressure. Therefore, it was not known at what level the pressure would stabilize. In September 1982, a decision was made to test the chemicals without the additive and to do so using an actual weapon containing the chemicals rather than a test reactor.

On October 7, 1982, a chemical test was conducted to determine if the pressure buildup observed in earlier tests had an upper limit. The test was to proceed for 1 hour or until weapon failure, starting at 68 degrees Fahrenheit. Five minutes after the mixing process was initiated, the weapon failed when pressure due to the high temperature forced the ballonet out of the weapon. Army testers said that they were surprised since they had expected the pressure to stabilize below the pressure attained in the test.

While the test failure was viewed with concern, the Army testers and Navy program officials were optimistic that a solution to the problem could be found and the program could still meet its production milestone. As late as January 1983, this optimism still prevailed, but in March 1983 program

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officials had to acknowledge that the milestone could not be met. By this time, the Army and Navy had studied several solutions to the pressure problem and decided that off-station mixing was the answer. OSD's review panel concurred. The pressure buildup phenomenon remains, but program officials do not consider it as serious as it would be had the mixing process continued to be done while the weapon still hung from the aircraft. Nevertheless, further development and operational tests are required to prove out off-station mixing.

In 1982, two other chemical tests were conducted that resulted in the ejection of the ballonet from the weapon. In February 1982, in a test conducted at the Army's Edgewood Arsenal, the retainer ring failed at a pressure of 140 pounds per square inch causing the ballonet to be forced out of the test reactor. This occurred 20 minutes after the mixing process started. The retainer ring has been modified, and we found no evidence that this type of failure had occurred again.

In May 1982, the Naval Weapons Center conducted a test to determine the maximum pressure that could be contained in the bomb. A highly active simulant was used so as to produce an excessive amount of heat and pressure. When the internal pressure reached about 650 pounds per square inch, the welded tabs on the unit housing the ballonet sheared off causing the ballonet to eject out of the weapon. This test verified the strength of the weapon's reactor unit, which is designed to have a capacity of 600 pounds per square inch. The Naval Weapons Center judged this test as a success since the designed capacity of the reactor unit was met.

REPORTING OF CHEMICAL TEST RESULTS

The general practice for reporting chemical test results was for the results to be reported to various offices within the Navy. Significant test results were briefed to Air Force, Army and contractor personnel. Our review of the chemical testing and discussions with Army and Navy personnel revealed that the test results were provided initially to two groups.

When the testing was completed and the results were verified by the Army testers at Edgewood Arsenal, the results were provided to the Navy's Bigeye technical project manager at the Naval Weapons Center and to the program manager at the Naval Air Systems Command. The test results were initially provided by telephone and were followed by a written report. The technical project manager also provided the program manager a monthly progress report summarizing the month's activities, including the chemical testing. For example, the technical project manager's November 1982 report on the progress made in October discussed the test failure and said that potential solutions were being considered.

In addition, the program office briefed various Navy departments, such as offices within the Office of the Chief of Naval Operations and the Naval Air Systems Command. Such test results were also discussed at scheduled periodic meetings involving Air Force, Army, and contractor personnel. For example, the agenda of the November 16, 1982, "Bigeye Chemical Reaction Meeting" listed the meeting's purpose as to

- "a. Determine Solutions to solve the Overpressure Problem;
- b. Identify Hardware Required to Effect the Identified Solutions;
- c. Lay Out the Schedule(s) and Lists for Each Solution."

Minutes of this meeting were distributed on November 18, 1982, to all service headquarters.

DOD'S STEERING COMMITTEE
ON CHEMICAL MATTERS

This committee was established to monitor chemical development and disposal programs, including policy, chemical, and biological defense programs; chemical retaliatory programs; demilitarization; and DOD participation in arms control efforts. While there is no written charter on the committee's objectives, the Deputy Assistant to the Secretary of Defense for Chemical Matters, who served as deputy chairman of the committee, told us that the committee was responsible for evaluating the status of the Bigeye program relative to cost, schedule, and performance. The committee is composed of general officers of the office of the Joint Chiefs of Staff, the Army, the Navy, the Air Force, and the Marine Corps, as well as representatives from OSD, including the Assistant to the Secretary of Defense for Atomic Energy, who serves as chairman. In responding to our draft report, the former Deputy Assistant stated that the committee was a coordinating body which addressed a broad range of issues, such as policy, budget, arms control, and training and exercises. He said the committee was not intended to be nor could it effectively serve as a review group for a technical program.

During calendar year 1982, the steering committee met with the Navy's Bigeye program office at least three times--in June, July, and again in October. While we found no minutes to determine who had attended and what had been said during the meetings, briefing charts indicated that technical problems had not been discussed, although such problems had been identified and recognized by the Navy program office in at least two instances before briefings to the committee. The Navy's program manager whom we interviewed confirmed that there was no discussion of Bigeye's technical problems at the committee meetings. Instead, the discussion addressed the purposes for which the meetings were called - production and financial matters.

For example, in a July 23, 1982, briefing to the committee, the discussion focused on Bigeye's production schedule and funding. The program office provided no information to the committee on the chemical pressure buildup problem or other technical problems being experienced in the program, although the program office's briefing to Navy representatives a week earlier had highlighted various development problems, including the chemical pressure problem.¹ Also, in a briefing on October 13, 1982, 6 days following the October 7 test failure, the program office disclosed no test failure or other technical problems to the steering committee. The discussion mainly involved obtaining funds from the Congress for testing and low-rate production. The program office advised us that it felt obliged to provide only the information requested by the committee.

In addition to interviewing the Deputy Assistant for Chemical Matters, we interviewed key committee personnel of the Army, Navy, and Air Force relative to the October 1982 failure. According to the Deputy Assistant, he was not aware of the October 1982 failure until December 1982. The Navy representative who served on the committee beginning in December 1982 told us that he had asked the program manager for a briefing on the Bigeye. During this briefing, he learned about the October 1982 failure and then advised the Deputy Assistant sometime in December about the incident. The prior Navy representative could not recall whether he had been advised of the failure. The Air Force representative told us that he had been told by his action officer of the incident in October 1982 but at that time did not recognize the seriousness of the problem. The Army representative stated that he was unsure as to the exact date when he was informed of the incident. The service representatives told us that they did not believe the time from the October 1982 failure to December 1982, when the Deputy Assistant learned of the failure, was inordinate because the program manager needed the time to evaluate the seriousness of the failure and to examine possible solutions to the problem.

¹Records of meetings and the matters discussed on the Bigeye are generally lacking in detail. Evidence indicates that the Navy representative to the steering committee, who retired in early December 1982, was briefed on the chemical pressure problem, but there is no indication on how the information was briefed or whether the representative attended the steering committee meeting 1 week later. The representative told us that he could not recall what he had been briefed on or whether he had attended the July 23, 1982, meeting.

The Deputy Assistant for Chemical Matters said he was concerned that he had not been told about the October test failure sooner than in December. When he was briefed in January 1983 by the Navy program office on the test failure and the possible solutions, he immediately appointed a program review panel of nongovernment personnel to advise him on the technical status of the program. In addition, in January 1983, he briefed staff members of the House and Senate Armed Services Committees on the test failure.

In March 1983, the panel informed OSD that while the Bigeye program appeared to be a viable program, meeting the fiscal year 1984 production milestone was considered a high risk because of the time needed to further analyze the Bigeye's problems and test solutions. In April 1983 hearings before the Subcommittee on Defense, Senate Armed Services Committee, the Deputy Assistant for Chemical Matters stated that a development problem had occurred and that funds for the Bigeye production for fiscal year 1984 were being withdrawn, which would delay production for 1 year. According to the Deputy Assistant, fiscal year 1984 production base funds for facilities and tooling were still needed to enable the long-lead groundwork to be completed before actual production began.

During calendar year 1982, one of the most important aspects of the program was the chemical testing. We believe, therefore, that the steering committee should have made certain the Navy program office kept it apprised of the status of such testing. At the same time, we believe the Navy program office was obliged to advise the committee of all matters relative to the Bigeye's development.

IMPULSE CARTRIDGE FAILURE

As a result of the request you made at a February 1984 hearing before the House Budget Committee for a report on the status of the Bigeye program, DOD, in March 1984, furnished to the Committee, as well as to the House and Senate Armed Services Committees, a report on the Bigeye's technical status.

According to the Office of the Deputy Assistant for Chemical Matters, the problems with the impulse cartridge (which is housed in the central injector), are not identified in the DOD report, but have since been corrected. Test reports we reviewed indicated that the impulse cartridge problem has been resolved.

NEED FOR BIGEYE TO BE DESIGNATED A MAJOR PROGRAM

The Bigeye program has not been designated as a major program. In commenting on this report (enclosure III) the Department of Defense pointed out that one of the thresholds for

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designating a system as major is a production cost of \$1 billion in fiscal year 1980 constant dollars, and that Bigeye's expected procurement cost is considerably below this threshold. According to the Navy program office, Bigeye's production cost in fiscal year 1985 constant dollars is about \$1 billion.

While this does not meet the "constant fiscal year 1980 dollar" requirement, there are other reasons for designating Bigeye a major system, particularly, to give the program greater visibility in Defense and in the Congress. Designating it a major program would impose added reporting requirements on program officials which would require that information on the program status be reported regularly to the Congress.

Major programs must have their test and evaluation master plan (TEMP) reviewed and approved by OSD's Director, Defense Operational Test and Evaluation. The TEMP for the Bigeye program is not now required to be approved outside the Department of the Navy. Further, the Office of the Director, Defense Operational Test and Evaluation, would monitor significant aspects of the Bigeye testing and, before each major milestone decision, would give the Defense Systems Acquisition Review Council (DSARC), which reviews major weapon programs for the Secretary of Defense, its assessment of the adequacy of the testing and the results. As a major program, the Bigeye would also be reviewed by the Secretary of the Navy through the Navy's Systems Acquisition Review Council before the DSARC review. The Bigeye, since it has not been designated a major program, presently requires no such reviews.

Bigeye's program status, if it were a major program, would also have to be included in a selected acquisition report which would provide weapon system information to the Congress. Also, a unit cost report to the Congress would be necessary if, in any fiscal year, the weapon program's unit cost were to increase more than 15 percent.

In view of the congressional interest and sensitivity of the program and since production costs are currently estimated at about \$1 billion, we are recommending to the Secretary of Defense that he designate Bigeye a major program.

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RESEARCH AND
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THE UNDER SECRETARY OF DEFENSE

WASHINGTON D.C. 20301

24 SEP 1984

Mr. Frank C. Conahan
Director
National Security and International
Affairs Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Conahan:

This is the Department of Defense (DoD) response to the GAO Draft Report, "Testing of the BIGEYE Binary Chemical Bomb Under the Direction of the Department of the Navy," dated August 1984, (GAO Code 393006), OSD Case No. 6598.

The Office of the Secretary of Defense (OSD) and the Services cooperated fully with the auditors in providing information, and the auditors conducted a painstaking investigation. Our review of the resulting draft report shows it to be generally accurate and reasonable. However, there are two major concerns.

First, in his 4 October 1983 letter to the Comptroller General of the United States, Representative Bethune accused the DoD and certain of its employees of deceit and of intentionally keeping information from Congress during 1982 and early 1983 on a BIGEYE research and development problem, and he requested that the GAO investigate. After reviewing your report and based on the verbal comments of the auditors, it is apparent that the GAO concluded that DoD did not intentionally withhold information on BIGEYE problems from Congress. In view of the seriousness of Mr. Bethune's accusations and their widespread airing in the media, The Department is disappointed that the GAO report does not directly address the issue. The first paragraph of the proposed letter report identifies Mr. Bethune's charge as the key issue, yet it is not until the eighth paragraph, that the findings are indirectly addressed when the report acknowledges that OSD officials discussed the problem with the appropriate committee staffs shortly after learning of the problem from the Navy. The DoD did not cover up, attempt to deceive, or withhold information from the Congress as was alleged, and it is only just that the report directly acknowledge this fact.

Secondly, paragraph 10 of the draft letter report addresses Mr. Bethune's inquiry as to why critics of BIGEYE were not made aware until May 1984 of the test failure involving the impulse

cartridge which occurred in January 1984. The letter report states that there were no records to indicate that DoD ever considered reporting the incident to the Congress. However, the "Impulse Cartridge Failure" section of the enclosure to the report acknowledges that DoD submitted a report to the House Budget Committee in March 1984 in response to a general question by Mr. Bethune on the status of BIGEYE in a February 1984 hearing. The enclosure further acknowledges that the report mentioned problems with the central injector mechanism (which includes the impulse cartridge). As written paragraph 10 of the proposed letter report could be misconstrued. DoD viewed the impulse cartridge (as opposed to the pressure buildup problem) as one of several minor problems which have been addressed in the history of the program. As confirmed in the report, it was easily corrected and has not recurred.

DoD is still reviewing the recommendation to designate BIGEYE as a major system in order to provide additional review of testing and additional reporting to Congress. Such designation would impose increased costs in terms of manpower, time, and dollars and other options may be available which would provide the benefits with fewer drawbacks. The short time allowed for response to the draft report was insufficient to complete the thorough assessment which is necessary prior to a decision.

Attached are more specific comments on the draft report's findings and recommendation.

Sincerely,



James P. Wade, Jr.
Principal Deputy Under Secretary of
Defense for Research & Engineering

Attachment

GAO DRAFT REPORT - DATED AUGUST 22, 1984
(GAO CODE NO. 393006) - OSD CASE NO. 6598

"TESTING OF THE BIGEYE BINARY CHEMICAL BOMB UNDER THE DIRECTION
OF THE DEPARTMENT OF THE NAVY"

DEPARTMENT OF DEFENSE COMMENTS

* * * * *

FINDING

- o **FINDING A: Bigeye Has October 1982 Chemical Test Failure.**
GAO's review focused primarily on the events and reporting of them to a DoD oversight committee and the Congress, surrounding an October 1982 chemical test failure which caused a restructuring of the Bigeye program. GAO found that the test failure resulted from a chemical reaction between the bomb's binary chemicals, which produced a rapid increase in temperature and pressure that caused an inner section to be forced out the rear of the weapon. (p. 1, p. 9/GAO Report) [See GAO note.]
- o **DoD RESPONSE:** The original BIGEYE bomb concept called for the pilot to initiate mixing of the binary chemicals (QL and sulfur) a minute or two before dropping the bomb. However, in October 1982, a test to explore one specification (safe carriage of a mixed BIGEYE) showed that if the bomb was warm enough when mixing started, sufficient pressure could build up inside after a period of time to cause the rear seal to fail and release agent. This would not have affected peacetime safety or wartime safety up until the time the pilot mixed the bomb. It would have constituted a problem only if the mixed bomb could not have been dropped as planned due to failure of the release mechanism or an aborted mission. While these are low probability events, they do occur, and the risks were judged to be unacceptable. Although the pressure was great enough to partially eject the central injector mechanism from the bomb, the major concern was not a risk to the pilot and the aircraft as implied in the draft report, but rather it was the risk of dispensing toxic agent outside the target area.

The draft report's description of why the full impact of the problem was not realized until early 1983 is essentially accurate. However, the draft report implies that the change to low altitude tactics was an administrative one somehow linked to the Secretary of Defense's decision to restart the program in 1976. Actually, as air defense systems became more and more capable of shooting down aircraft at high altitudes, our tactics changed to lower altitudes and higher speeds. For BIGEYE this change resulted in higher weapon temperatures.

- o **FINDING B: DoD Steering Committee Not As Diligent In As It Should Have Been Monitoring Bigeye Chemical Testing Problems.** GAO found that the DoD Steering Committee, composed of representatives of the Assistant to the Secretary of Defense for Atomic Energy (ATSD(AE)) and the Services, and formed to monitor costs, schedule and performance of chemical programs such as Bigeye, was not as diligent as it should have been in following Bigeye testing problems during 1982. GAO reported that the Navy briefing charts used at the meeting indicated that technical problems were not discussed at three 1982 meetings on Bigeye, although those problems had been identified within the Navy program office prior to the briefings. In addition, GAO found that the program office disclosed no test failure or developmental problems in a briefing to the steering committee that occurred six days after the October 1982 test failure. GAO reported that the Navy program office advised that it felt obliged only to provide information requested by the steering committee. GAO concluded that the Navy program office was not as forthright as it should have been in keeping the DoD steering committee apprised of Bigeye's testing problems. (pp. 2-3, pp. 11-13/GAO Report)
- o **DoD RESPONSE:** The proposed report states that the DoD Chemical Steering Committee was established for the purpose of monitoring chemical warfare programs (by implication primarily BIGEYE) as regards cost, schedule, and performance. The actual role of the Steering Committee is far more broad. It serves as an oversight body and advises the DoD Chemical Focal Point on all aspects of chemical matters which have included policy, chemical and biological defense programs, chemical retaliatory programs, demilitarization, and DoD participation in arms control efforts. The Committee has been primarily policy and operationally, rather than technically, oriented, and membership is primarily drawn from the plans and operations areas with research and development organizations called upon when needed. Upon identification of a BIGEYE technical problem with potential schedule impact, a special technically oriented review panel was organized.

Regarding the forthrightness of the Navy program office in keeping the Steering Committee advised of BIGEYE development problems, it should be recognized that the pressure problem was only one among many problems that have been recognized and resolved during the program history. Prior to October 1982, the developers believed that the problem might not exist in the actual bomb (as opposed to the test reactor). Even after October, there was optimism for some time that the problem could be solved within schedule and within the resources available to the program manager. It is an American characteristic (not only a military one) to try to understand and solve problems and only elevate them, particularly to

very high levels, after we have given them our best effort. With hindsight, it is clear that the program management and the Navy should have elevated the problem sooner; however, in the context of the day, it was not clear to those involved.

- o **FINDING C: OSD Formed External Program Review Panel To Evaluate Bigeye's Status.** GAO reported the ATSD(AE) representative, the Deputy ATSD for Chemical Matters said he was concerned that he was not told about the October 1982 test failure until December 1982. GAO found that after being briefed on the test failure by the Navy program Office in January 1983, the Deputy ATSD for Chemical Matters formed a program review panel composed of non-governmental personnel to review the status of Bigeye. GAO further found that the Deputy ATSD also briefed House and Senate Armed Services Committee staff members on the October 1982 test failure. (p. 3, p. 12/GAO Report)
- o **DoD RESPONSE:** The BIGEYE Review Panel consisted of non-DoD personnel with extensive expertise in applicable technology and program management. The Panel's charter was to assess the soundness of the basic BIGEYE design, the likelihood that (then existing) program milestones could be met, and the adequacy of resources devoted to the development effort.
- o **FINDING D: Review Panel Found High Risk In Maintaining Acquisition Schedule.** GAO reported that in March 1983, the review panel informed the Deputy ATSD for Chemical Matters that maintaining the then current Bigeye acquisition schedule would involve high risk because more time was needed to analyze technical problems and test solutions. GAO further found that as a result of the panel report, the Deputy ATSD informed Congress that DoD was delaying production one year and withdrawing Bigeye production funds from its FY 1984 budget request. (p. 3, pp. 12-13/GAO Report)
- o **DoD RESPONSE:** The BIGEYE Review Panel's major conclusions were that with the introduction of the concept of off-station mixing, the basic BIGEYE technology and design appeared sound; identified problems appeared solvable and contemplated fixes appeared workable; and the probability of making required changes and completing testing to meet an FY 1984 procurement was low.
- o **FINDING E: Review Panel Concurs That Off-Station Mixing Is Solution To The Chemical Pressure Buildup Problem.** GAO found that the chemical pressure buildup phenomenon remains as a factor in the Bigeye program. GAO also found that after studying various solutions to the pressure problem, the Army and Navy decided that mixing the chemicals after the weapon

was released from the aircraft would be the answer (off-station mixing), and the DoD panel concurred with this solution. GAO reported program officials believe that while the pressure phenomenon remains, the new approach makes it less serious than it was when the mixing process was to be done while the weapon still hung from the aircraft. GAO concluded, however, that further development and operational tests are required to prove out the off-station mixing concept. (p. 4, pp. 9-10/GAO Report)

- o **DoD RESPONSE:** The solution to the pressure buildup problem was to change the employment concept to mix the QL and sulfur (make agent) only after the bomb is released from the aircraft. This change involved the addition of a self-contained power device for initiating the mixing process. With the modified mechanism installed mixing is initiated by a lanyard when the weapon falls away from the aircraft. A distinct action by the pilot is required to arm the lanyard mechanism; thus, an accidentally dropped or jettisoned bomb will not mix. With off-station mixing, BIGEYE will not contain toxic agent prior to being dropped toward the target. This change eliminates the risks associated with carrying a mixed BIGEYE (or a current unitary chemical weapon) aboard an aircraft.

The effectiveness of this concept has been proven in a series of flight and ground tests. Further testing is planned to obtain additional operational data.

- o **FINDING F: Impulse Cartridge Failure In Bigeye Has Been Corrected.** GAO reported it was unable to determine why critics of the Bigeye system were not informed until May 1984 of the impulse cartridge failure that occurred four months previously. Further, GAO found no records indicating that DoD had considered reporting the incident to the Congress. GAO reported, however, that according to the Deputy ATSD for Chemical Matters, the failure was easily corrected and there has been no recurrence. GAO concluded that this view was correct since its examination of subsequent test results did not show any repetition of the failure. (p. 4, p. 13/GAO Report)
- o **DoD RESPONSE:** The "Impulse Cartridge Failure" section of the enclosure to the report acknowledges that DoD submitted a report to the House Budget Committee in March 1984 in response to a general question by Mr. Bethune on the status of BIGEYE in a February 1984 hearing. The enclosure further acknowledges that the report mentioned problems with the central injector mechanism (which includes the impulse cartridge). As written paragraph 10 of the proposed letter report could be misconstrued. DoD viewed the impulse cartridge (as opposed to the pressure buildup problem) as one of several minor problems which have been addressed in the

history of the program. As confirmed in the report, it is easily corrected and has not recurred.

- o **FINDING G: Bigeye Has Not Been Designated A Major Program.**
GAO reported that the Bigeye program has not been designated a major program for monitoring and programming requirements. GAO found, however, that according to the Navy Program Office, Bigeye production costs are estimated at about \$1 billion, which is the threshold for major program status. GAO noted that if Bigeye were designated a major program, this would mean (1) its test and evaluation plans would have to be approved by the DoD Director, Test and Evaluation; (2) it would have to pass review, at each milestone, before the Defense and Navy System Acquisition Review Councils, and (3) the Navy would be required to provide a selected acquisition report on Bigeye to the Congress. (p. 4, p. 13/GAO Report)
- o **DoD RESPONSE:** The production cost threshold for major system status is \$1 billion in FY 1980 constant dollars. The expected procurement cost for BIGEYE is considerably below this threshold. However, the Secretary of Defense may designate a system as major even if it does not meet the cost criteria. Before making a decision, it is necessary to consider a number of factors. These include the impact on the program (delay, added cost, and additional manpower for reporting), the status of the program (nearing the end of development), the possible benefit of additional review of operational test and evaluation and the availability of information to DoD officials and Congress (i.e., would a selected acquisition report make available information to Congress which is not already reported in some other way). Also options which might provide the benefits of major program status while avoiding the drawbacks need to be considered.

RECOMMENDATION

- o **RECOMMENDATION:** In view of the Congressional interest and the sensitivity of the Bigeye program, and since total production costs are estimated at about \$1 billion (the threshold for designating a program as major), GAO recommended that the Secretary of Defense designate Bigeye a major program. (p. 4, p. 14/GAO Report)
- o **DoD RESPONSE:** The GAO recommendation to designate BIGEYE a major system is being carefully considered. However, as stated in the basic letter, the short period allowed for review of the draft report was not sufficient to complete the assessment and reach a decision.

ENCLOSURE

September 25, 1984

Mr. Frank C. Conahan, Director
United States General Accounting Office
Washington, D.C. 20548

Dear Mr. Conahan:

Thank you for the opportunity to comment on the draft report titled "Testing of the Bigeye Binary Chemical Bomb Under the Direction of the Navy." This courtesy typifies the thoroughness and professionalism exhibited by the GAO staff conducting this investigation.

I believe the draft report provides a generally accurate depiction of the Bigeye development history. Further I agree in principle, with the draft report's primary recommendation, i.e. that Bigeye receive the high level attention and review accorded major development programs.

I do have the following specific concerns with the draft.

I am disappointed at the absence of a summary statement regarding the allegations of cover up and deceit. These allegations were made in a strongly worded (to say the least) letter to the GAO from Congressman Bethune and received media attention, including a Jack Anderson column. I knew these allegations to be false with regard to the actions of my office, and although I was concerned at the less than satisfactory internal DoD communication in late 1982, I did not believe that anyone connected with the Bigeye program engaged in deceit or cover up. Based upon reading the draft report, and conversations with the GAO investigators, I perceive the GAO does not believe there was a deliberate attempt to conceal the status of Bigeye. A clear statement to that effect, addressing the allegations, would be most welcome.

The draft report implies, on page 4, that the DoD did not report the impulse cartridge problems to Congress until May 1984. In fact the DoD reported the problem earlier e.g.: in a March 1984 reply to the House Budget Committee.

Finally I take issue with the draft report's finding that the DoD Chemical Matters Steering Committee was not as diligent as it should have been in monitoring the problems experienced in chemical testing of the Bigeye in calendar year 1982. The Steering Committee is a coordinating body which addresses a

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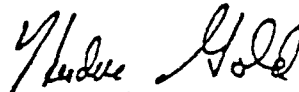
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September 25, 1984
Mr. Frank C. Conahan, Director

very broad range of issues including policy, arms control, budget, training and exercises. It was not intended, nor could it effectively serve, as a review group for a technical program. Beginning in January 1983, high level review of the Bigeye Program was increased, with my office in OSD serving as the focal point. Your recommendation to designate Bigeye as a major program offers one approach to ensure continued attention and review. DoD may be able to identify other, more efficient, ways to achieve the same result.

A final observation. All development programs encounter problems. The perspective of hindsight easily distinguishes major (impacts resources, schedule or performance) from minor problems. Program managers and engineers facing decisions in real time must rely upon more fallible tools than hindsight. For example, as late as March 1983, there were still technical voices within the Bigeye development community expressing belief that the pressure buildup problem could be solved with little or no schedule or resource impact.

I trust that your report will close the case on these unwarranted allegations which have diverted attention from the legitimate and difficult issues regarding the adequacy of our chemical warfare deterrent.

Sincerely,



Theodore S. Gold

EXCERPTS CONCERNING THE BIGEYE BOMB FROM OUR REPORT
ENTITLED "RESULTS OF GAO'S REVIEW OF DOD'S FISCAL YEAR
1985 AMMUNITION PROCUREMENT AND PRODUCTION BASE PROGRAMS"

QUESTIONABLE PROCUREMENT OF WAR RESERVE STOCK

The \$36.5 million request for machine gun ammunition includes \$6.5 million for 30-mm. cartridges that is questionable because it would provide war reserve stock for a program that has not yet been funded. Further, the budget backup does not include documentation supporting the request; e.g., the quantity and types of 30-mm. rounds to be purchased, procurement history and planning data, production schedules, or requirement studies pertaining to the \$6.5 million request.

A NAVAIR official told us that the 30-mm. ammunition was to be used on the A-4 and F-4 aircraft but that the research and development program to retrofit 30-mm. guns on these aircraft had not yet been funded. Since the retrofit program is still unfunded, it is questionable that funds are needed to establish war reserve stocks.

The Navy agrees and suggests the \$6.5 million be used to fund other items.

PREMATURE PROCUREMENT OF BIGEYE BOMBS

The Bigeye bomb is a binary chemical weapon that is aircraft delivered and similar in size and weight to the Rockeye II weapon system. It contains two nonlethal chemicals (QL and sulfur) which, when mixed, form a toxic nerve agent (VX).

The Navy's request of \$19.7 million for the Bigeye bombs may be premature because (1) funding is limited to bomb components, (2) chemical munitions production facilities are not available, and (3) there are continuing technical problems with the bomb.

Background

Technological effort necessary for developing the Bigeye weapon system began in 1959 at the Army's Edgewood Arsenal and continued into exploratory development with Navy funding. Testing of full-scale weapons was in progress in 1969 when the program was terminated. After a 7-year suspension, engineering development of the Bigeye weapon system was resumed in October 1976.

The Bigeye has a temperature/pressure problem that can cause internal damage. The first all-up weapon test, conducted on October 7, 1982, disclosed that when the two chemicals mix, the interior temperature and pressure rises. This can cause the

ENCLOSURE IV

ENCLOSURE IV

Bigeye to rupture at the tail end. The problem has not been solved, and since such a rupture could expose the pilot and aircraft to the nerve agent, the mixing/delivery method has been changed from on-aircraft mixing with low level delivery to mixing the chemicals after the Bigeye bomb is released from the aircraft. Delivery has been changed to the level/loft method. This method requires the aircraft to fly in low in order to avoid enemy antiaircraft fire and just before releasing the bomb, the aircraft quickly climbs from about 200 feet to about 700 feet. The release point is determined by the aircraft's computer and occurs about 2 to 3 miles from the target area. The aircraft continues to climb to 1,200 to 1,400 feet before it can resume low level flight.

Under the new mixing method, the pilot and aircraft are in less danger of being exposed to the nerve agent, but the new delivery technique may cause the aircraft to be more vulnerable to enemy antiaircraft fire.

Under the current level/loft delivery method, the weapon will have between 10 and 35 seconds after release for the two chemicals to properly mix and spray over the target area.

Developmental Testing and Evaluation (DT&E) was scheduled for May 1984.

Funding request limited to components

The documentation supporting the Navy's fiscal year 1985 budget request of \$19.7 million indicates the Navy plans an advanced procurement of long-lead-time metal parts for 899 bombs. Further, the Navy's backup documents indicate that \$21.6 million more will be needed in fiscal year 1986 to complete the 899 bombs. The documents do not generally indicate how the funds would be used.

When we questioned the Bigeye program manager about the fiscal year 1985 funding, he said that the fiscal year 1985 request had been incorrectly stated. He explained that the \$19.7 million in the fiscal year 1985 request was principally for 449 empty Bigeye bomb bodies (total unit price, \$43,425) which would be ready for filling with QL when such approval was granted by the Congress. The program manager advised us that the unit price estimate had been developed by The Marquardt Company without the benefit of a should-cost study.

The Navy anticipates a contract for 899 empty Bigeye bomb bodies to be awarded in January 1985. This procurement includes

449 empty bomb bodies for the Navy and 450 empty bomb bodies for the Air Force. The Navy anticipates first delivery in July 1986 with final delivery in January 1987.

Chemical munitions production/
facilities not available

Bigeye production facilities are not available. The Congress deleted the services' fiscal year 1984 requests for the Bigeye and related production facilities. The Army is requesting fiscal year 1985 funding for three production facilities needed to produce the Bigeye. If funded, such facilities will not be available for production until some time in the future. For example, the QL production facility will not be available until about October 1987 with QL production about November 1987. It seems appropriate to request funding for the bomb after the facilities are approved and funded.

Continuing technical problems

Technical problems still plague the Bigeye bomb development. Test failures occurred on January 18, 1984 (test L-26), and February 14, 1984 (test L-29). These tests were intended to evaluate the chemical and mechanical effects of functioning a Bigeye bomb at 120 degrees Fahrenheit.

Due to the failures that occurred during test L-29, it was concluded that no evaluation of the chemical and mechanical effects of functioning a Bigeye bomb at 120 degrees Fahrenheit could be made. Test L-29 was a repeat of test L-28 and basically disclosed the same failures.

On March 14, 1984, another 120-degree Fahrenheit test was conducted; however, test data was unavailable during our review. Further, the Bigeye bomb cannot meet the operational temperature requirement (minus 40 degrees Fahrenheit to 140 degrees Fahrenheit) for producing VX with the minimum purity percentage. Currently, the minimum VX purity can be obtained only between minus 20 degrees Fahrenheit and 120 degrees Fahrenheit.

Finally, the Bigeye's proximity fuze, the FMU-140, failed an electromagnetic test. The Bigeye program manager advised us that the fuze problem should be corrected by May 1984 but that if it was not, then no satisfactory fuze would be available for the Bigeye DT&E, which was also scheduled for May 1984.

Considering that QL will not be available for months after the bomb bodies are delivered and in view of the still unresolved technical problems, the Navy's request for \$19.7 million for empty bomb bodies is questionable.

Navy comments

The Bigeye program manager commented that the Navy's fiscal year 1985 request for \$19.7 million had been revised to 425 metal parts sets (unfilled Bigeye bombs) at \$46,353 each. Also, he commented that the QL facility would be available in July 1987 and that both it and the load, assemble, and pack (LAP) facility were sized to produce QL at a rate much greater than the metal parts could be produced. Therefore, metal parts sets must be stockpiled. Furthermore, the Navy now expects delivery of the first metal parts sets from fiscal year 1985 procurement in November 1986 with final delivery in May 1987.

Regarding the unresolved technical problems, he commented that the March 14, 1984, 120 degree Fahrenheit test was fully successful with valid data obtained on the chemical reaction. Further, he informed us that preliminary testing of the FMU-140 fuze with a fix installed for the electromagnetic problem was successful and there would be no impact due to the fuze problem on the Bigeye DT&E program. Also, with regard to the loft delivery of the Bigeye, he commented that the vulnerability of the pilot and aircraft was no different than would be experienced with any other weapon in any operational scenario.

Navy officials essentially endorsed the project manager's comments in its response to our draft report.

Although we did not have time to verify and evaluate some of the program manager's comments, we did visit the Army test facility to obtain additional data. At the facility, we were informed that although construction of the QL facility would be completed in July 1987, QL would not be available until October 1987, or several months after final delivery of the metal parts sets. Further, the March 14, 1984, 120-degree Fahrenheit test was not fully successful because the minimum VX purity was not obtained, but a subsequent test in April 1984 was successful. However, testing to date has not demonstrated that the Bigeye is operational within the required temperature range of minus 40 degrees and 140 degrees Fahrenheit. Therefore, we believe that it is not prudent to fund the procurement and stockpiling of metal parts sets until testing is complete, the design is stable, and the Congress gives approval for the production facilities.

ITEMS REQUIRING SPECIAL ATTENTION

The Navy is requesting \$60.5 million for LLLGB kits and 25-mm. machine gun ammunition. We believe these requests bear close monitoring by the Committees for reasons explained below.

Air Force officials stated that Durandal was not the preferred weapon and that they would like to replace it with a more effective weapon in the near future. One of the candidate delivery systems for replacing Durandal uses a Boosted Kinetic Energy Penetrator which craters runways much like Durandal but should provide enhanced effectiveness through using multiple submunitions rather than a single warhead. Air Force officials stated that while the submunition itself could be ready for production by fiscal year 1986, the availability of a carrier for these submunitions was uncertain. The Air Force is currently evaluating carriers for the Boosted Kinetic Energy Penetrator.

Because the Durandal does not fully satisfy the Air Force needs and a new weapon is being developed, the Committees may wish to delete or significantly reduce the request in favor of new, improved weapons. A 50-percent reduction of \$24.1 million would maintain the program at about the level of the fiscal year 1984 program.

According to Air Force officials, the program should be fully funded because a replacement weapon cannot be expected from production until 1990.

PREMATURE PROCUREMENT OF BIGEYE BOMBS

The entire request for Bigeye bombs may be premature because (1) funding is limited to bomb components, (2) chemical munition production facilities are not available, and (3) there are technical problems with the bomb.

The Air Force fiscal year 1985 budget request includes \$19.8 million for 434 Bigeye bombs,² broken out as follows:

²The President's budget does not show any quantity for the Bigeye bomb. According to an Air Force official, proposed funding for fiscal year 1985 is intended to procure unfilled bomb bodies (complete units minus the chemical fill). Funding for the chemical fill for both fiscal years 1985 and 1986 requirements will be requested in fiscal year 1986. This exception to the full funding policy was approved by the Assistant Secretary of Defense, Comptroller, on January 6, 1984. The fiscal year 1985 quantity of 434 is included with the fiscal year 1986 program in the President's budget.

<u>Element of cost</u>	<u>Quantity</u>	<u>Cost</u> (millions)
BLU-80/B (Bigeye)	434	\$17.491
QL procurement (chemical)		-
Containers	434	.735
Data		.600
ECO/ECP		<u>.928</u>
Total cost		<u>\$19.754</u>

As discussed on page 2-11 in enclosure 2, the Congress deleted fiscal year 1984 requests for chemical munitions production facilities and technical problems encountered during development remain unresolved.

Air Force officials neither agreed nor disagreed with our assessment.

INVENTORY WILL EXCEED INVENTORY OBJECTIVES

The 30-mm. HEI cartridge is an explosive shell designed to destroy unarmored or lightly armored vehicles, personnel, or other targets. Its use is either with API cartridges in a combat mix when tanks are anticipated targets or alone when antiarmor capability is not needed. The API cartridge is a nonexplosive shell designed to destroy tanks. It is used only in the combat mix, which consists of five rounds of API for each round of HEI.

The request for 30-mm. cartridges is questionable because it includes about \$36.2 million for 2.288 million individual-use HEI cartridges when the asset position for these will exceed the inventory objective at the end of the fiscal year 1984 program. Instead of reducing the request by \$36.2 million, it may be possible to adjust the program and buy needed combat-mix cartridges. Also, we advised Air Force officials of a computation error that could have resulted in the request being overstated by about \$8 million for the armor-piercing incendiary round. They reduced the request by this amount.